Ciências ULisboa

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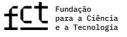
The conformal limit and projective structures

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Abstract:
In this talk we will study a gauge-theoretic construction of (branched) complex projective structures on a closed Riemann surface X of genus g ≥ 2. This construction underlies the celebrated conformal limit of Gaiotto and provides a preliminary understanding of its geometry.

More concretely, the non-abelian Hodge correspondence maps a polystable SL(2, R)-Higgs bun- dle on X to a connection which, in some cases, is the holonomy of a branched hyperbolic structure. (This happens for example in the Hitchin component.) On the other hand, Gaiotto's conformal limit then maps the same bundle to a partial oper, i.e., to a connection whose holonomy is that of a branched complex projective structure compatible with X. We will see how these are both instances of the same phenomenon, i.e. that the family of connections appearing in the conformal limit can be understood as a family of complex projective structures, deforming the hyperbolic ones into the ones compatible with X. For zero Toledo invariant, this deformation turns out to be optimal, inducing a geodesic on Teichmüller's space. This is joint work with Peter B. Gothen.

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